

10. From Prob 4

W18x74

$$C_c = 734, C_s = 1040$$

$$b_f = 7.64 \text{ in.}$$

$$C_2 = V'_L = 400 \text{ k} *$$

$$t_f = 0.810 \text{ in.}$$

$$t_w = 0.495 \text{ in.}$$

IN CONCRETE

$$a = \frac{400}{0.85(4)(54)} = 2.18 \text{ in.}$$

IN STEEL

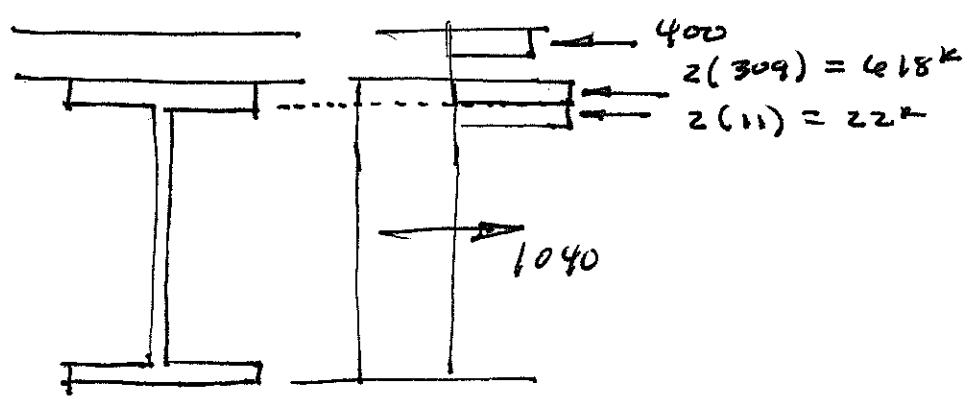
$$A_{s \text{ comp}} = \frac{1040 - 400}{2(50)} = 6.40 \text{ in}^2$$

assume PNA in web.

$$C_{\text{flange}} = 50(7.64)(0.810) = 309 \text{ k}$$

$$C_{\text{web}} = \frac{1040 - 400}{2} - 309 = 11 \text{ k}$$

$$x_{\text{in web}} = \frac{11}{50(0.495)} = 0.444 \text{ in.}$$



$$M_n = 1040 \left(\frac{18.5}{2} \right) + 400 \left(4 - \frac{2.18}{2} \right) - 618 \left(\frac{0.810}{2} \right) - 22 \left(0.810 + \frac{0.444}{2} \right)$$

$$= 10500 \text{ in-k} = 875 \text{ ft-k}$$

a) $\phi M_n = 0.9(875) = \underline{788 \text{ ft-k}}$ b) $\frac{M_n}{\Omega} = \frac{875}{1.67} = \underline{524 \text{ ft-k}}$